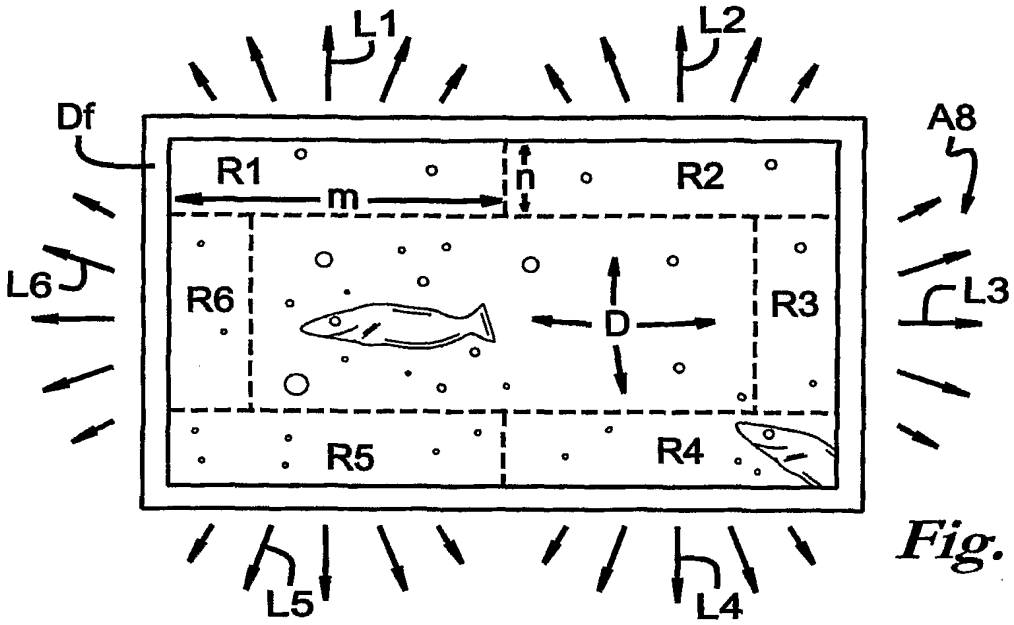


Fig. 1

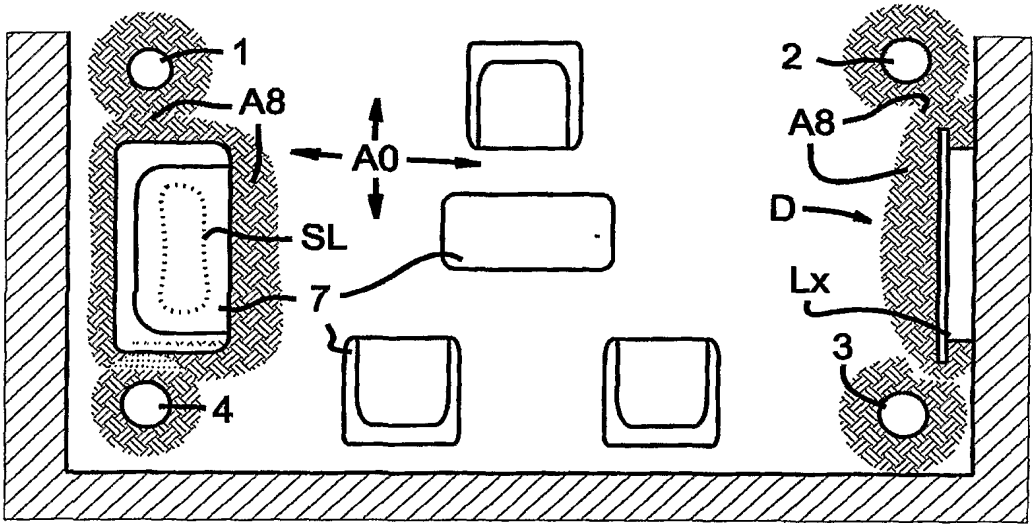


Fig. 2

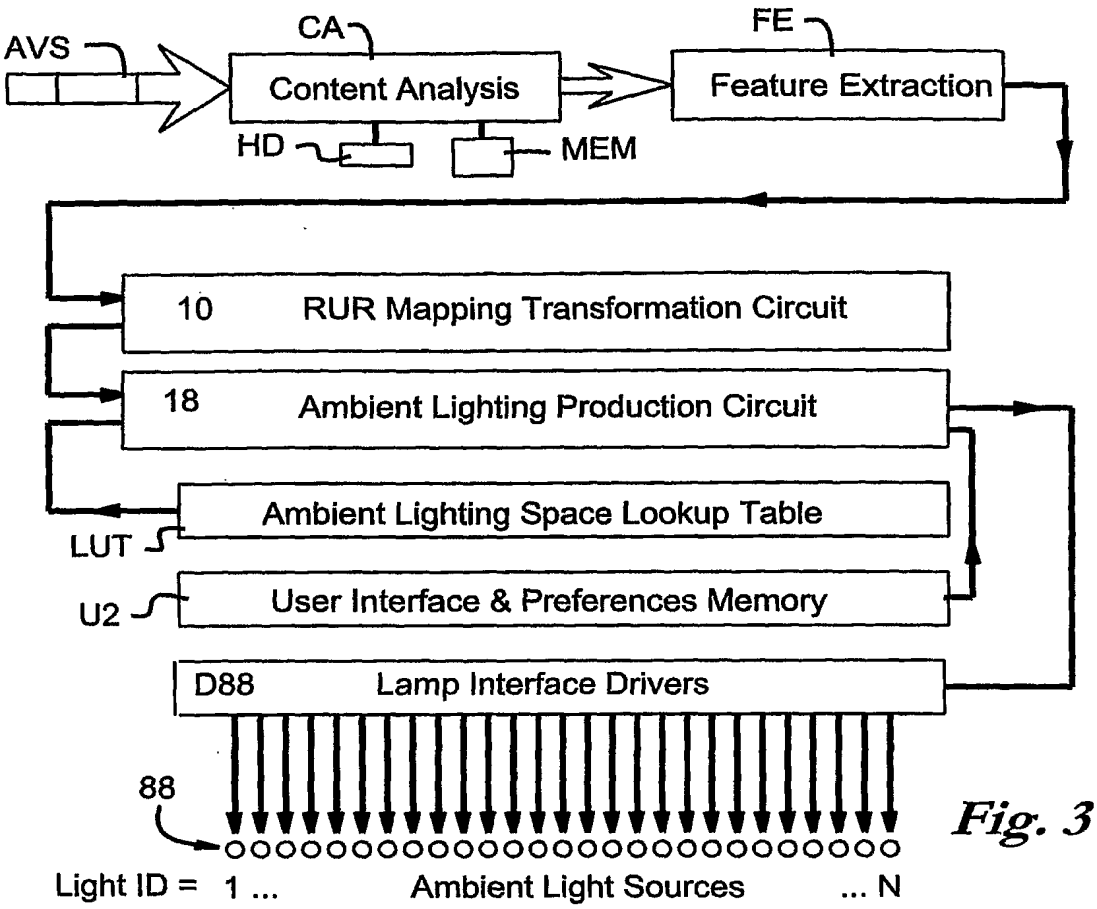


Fig. 3

$$R_{avg} = \frac{\sum_{i=1}^{n,m} \sum_{j=1} R_{ij}}{n \times m}$$

Fig. 4

-- Prior Art --

$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = \begin{bmatrix} X_{r,max} & X_{g,max} & X_{b,max} \\ Y_{r,max} & Y_{g,max} & Y_{b,max} \\ Z_{r,max} & Z_{g,max} & Z_{b,max} \end{bmatrix} \begin{bmatrix} R \\ G \\ B \end{bmatrix}$$

M

Fig. 5

$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = M_1 * \begin{bmatrix} R \\ G \\ B \end{bmatrix}$$

Video Display D

Fig. 6

$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = M_2 * \begin{bmatrix} R' \\ G' \\ B' \end{bmatrix}$$

Ambient Light Sources 88

Fig. 7

$$\begin{bmatrix} R' \\ G' \\ B' \end{bmatrix} = M_2^{-1} * M_1 * \begin{bmatrix} R \\ G \\ B \end{bmatrix}$$

Fig. 8

-- Prior Art --

$$M = \begin{bmatrix} S_r X_r & S_g X_g & S_b X_b \\ S_r Y_r & S_g Y_g & S_b Y_b \\ S_r Z_r & S_g Z_g & S_b Z_b \end{bmatrix}$$

Fig. 9

$$\begin{bmatrix} S_r \\ S_g \\ S_b \end{bmatrix} = \begin{bmatrix} X_w \\ Y_w \\ Z_w \end{bmatrix} \begin{bmatrix} X_r & X_g & X_b \\ Y_r & Y_g & Y_b \\ Z_r & Z_g & Z_b \end{bmatrix}^{-1}$$

-- Prior Art --

Fig. 10

$$\begin{bmatrix} S_r \\ S_g \\ S_b \end{bmatrix} \begin{bmatrix} X_r & X_g & X_b \\ Y_r & Y_g & Y_b \\ Z_r & Z_g & Z_b \end{bmatrix} = \begin{bmatrix} X_w \\ Y_w \\ Z_w \end{bmatrix}$$

-- Prior Art --

Fig. 11

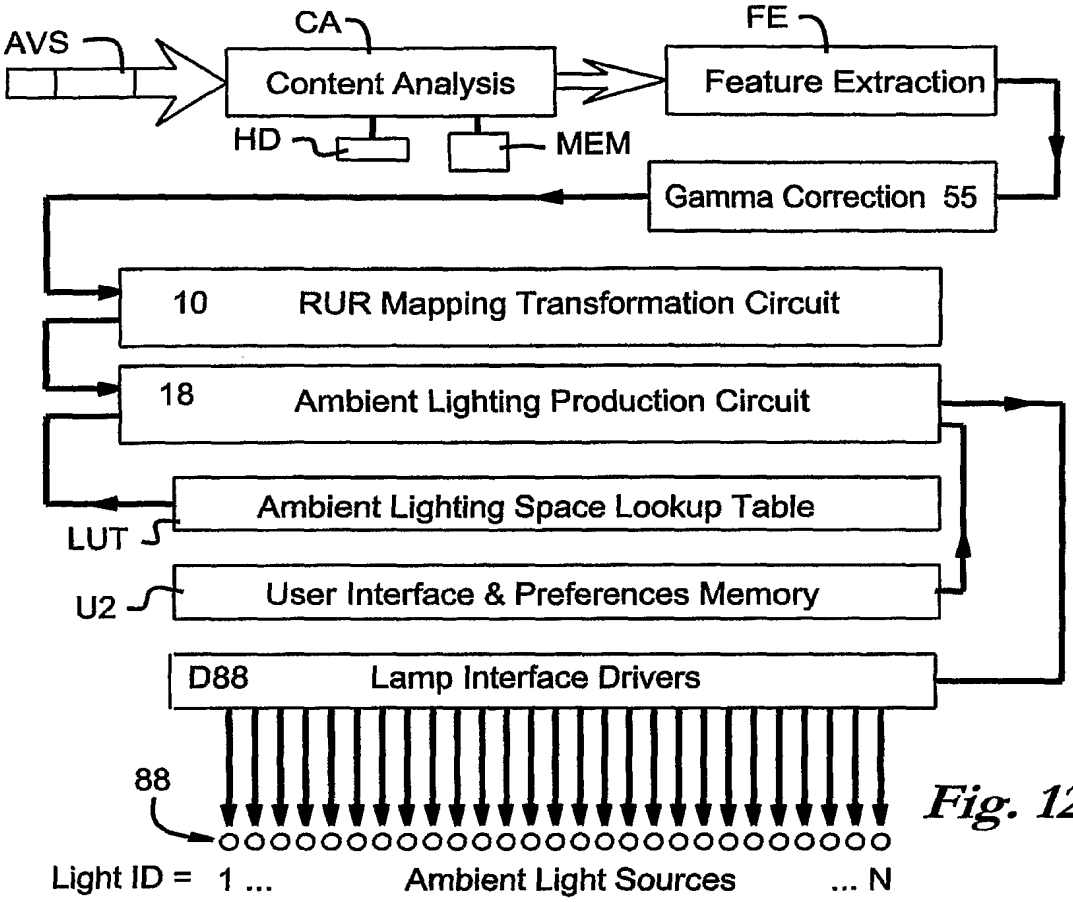

AVS
CA
Content Analysis
FE
Feature Extraction
HD
MEM
Gamma Correction 55
10 RUR Mapping Transformation Circuit
18 Ambient Lighting Production Circuit
Ambient Lighting Space Lookup Table
LUT
U2
User Interface & Preferences Memory
D88 Lamp Interface Drivers
88
Light ID = 1 ... Ambient Light Sources ... N

Fig. 12

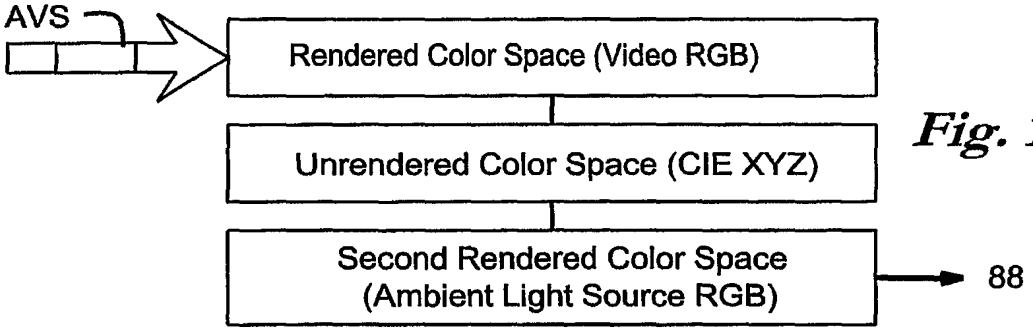

AVS
Rendered Color Space (Video RGB)
Unrendered Color Space (CIE XYZ)
Second Rendered Color Space
(Ambient Light Source RGB)
88

Fig. 13

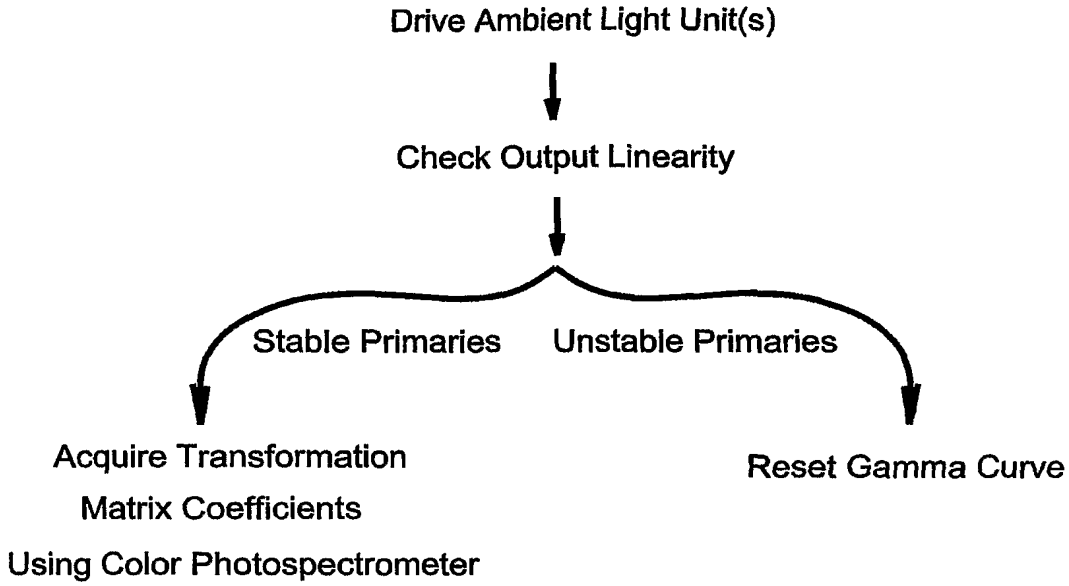

Drive Ambient Light Unit(s)
Check Output Linearity
Stable Primaries
Unstable Primaries
Acquire Transformation Matrix Coefficients Using Color Photospectrometer
Reset Gamma Curve

Fig. 14

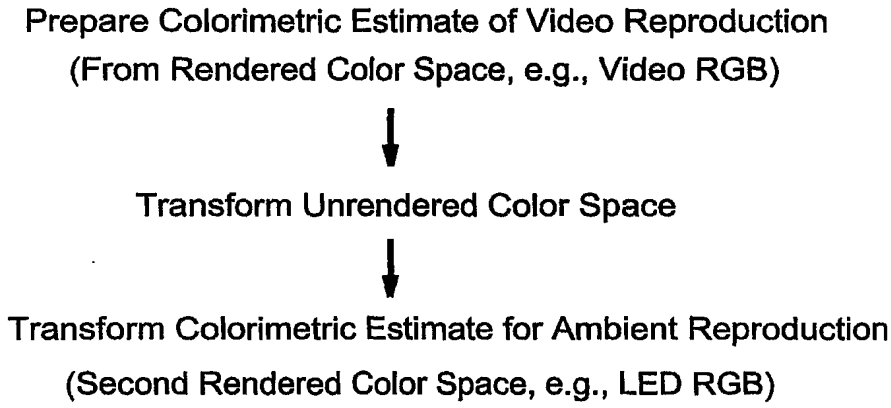

Prepare Colorimetric Estimate of Video Reproduction
(From Rendered Color Space, e.g., Video RGB)
Transform Unrendered Color Space
Transform Colorimetric Estimate for Ambient Reproduction
(Second Rendered Color Space, e.g., LED RGB)

Fig. 15

Fig. 16

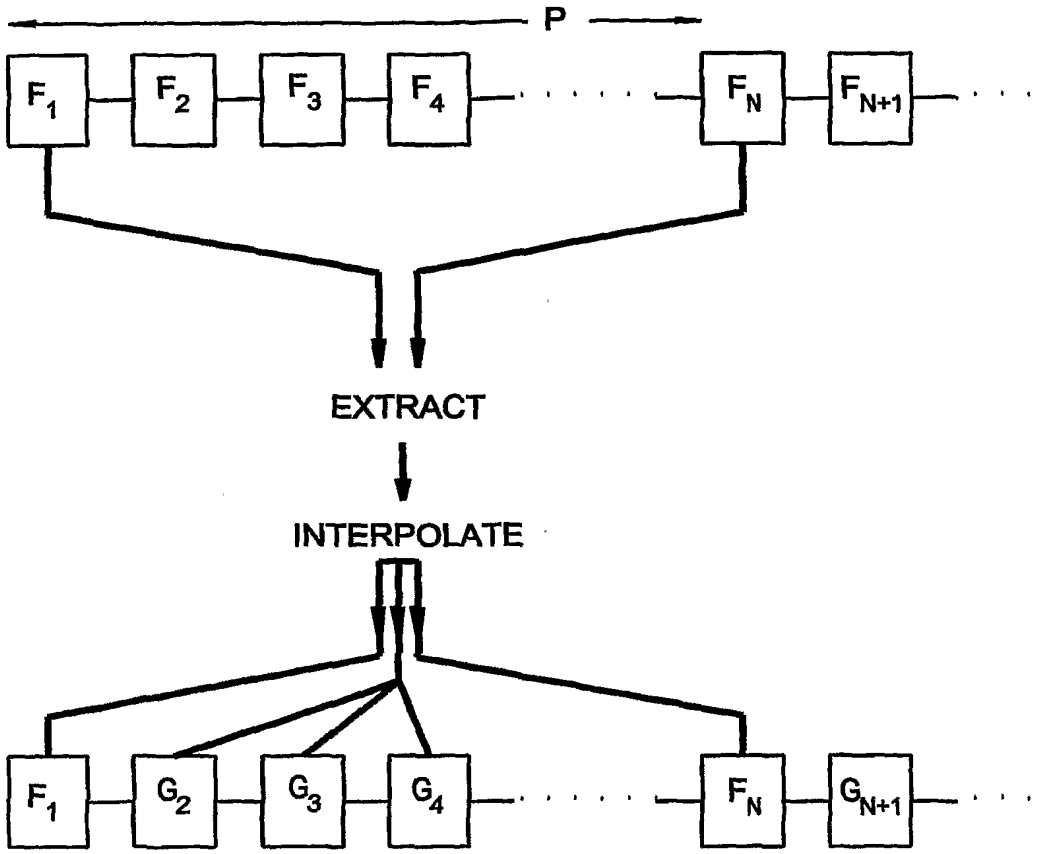
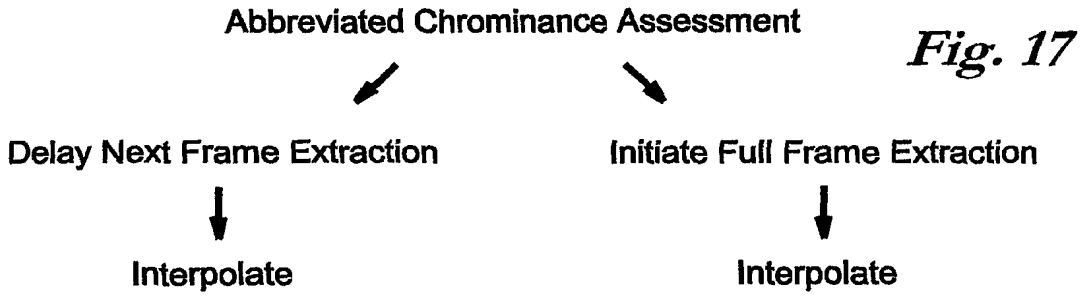

P
F1
F2
F3
F4
FN
FN+1
EXTRACT
INTERPOLATE
F1
G2
G3
G4
FN
GN+1

Fig. 17


Abbreviated Chrominance Assessment
Delay Next Frame Extraction
Initiate Full Frame Extraction
Interpolate
Interpolate

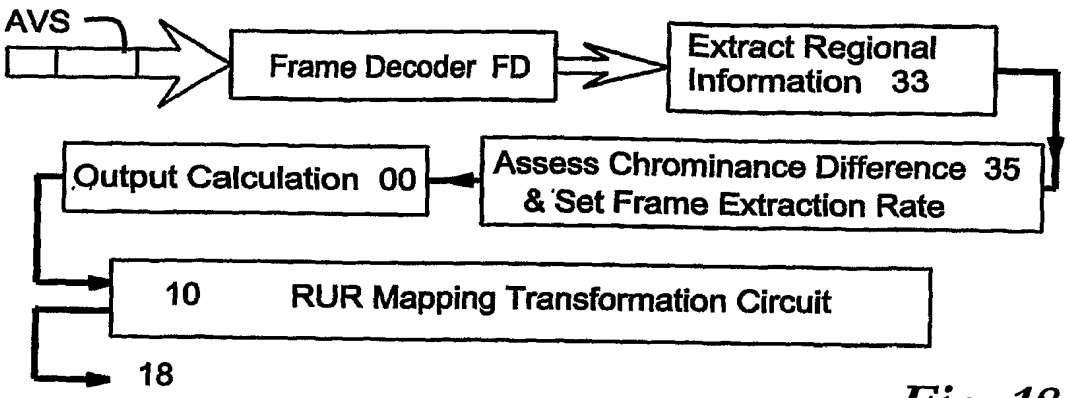


Fig. 18

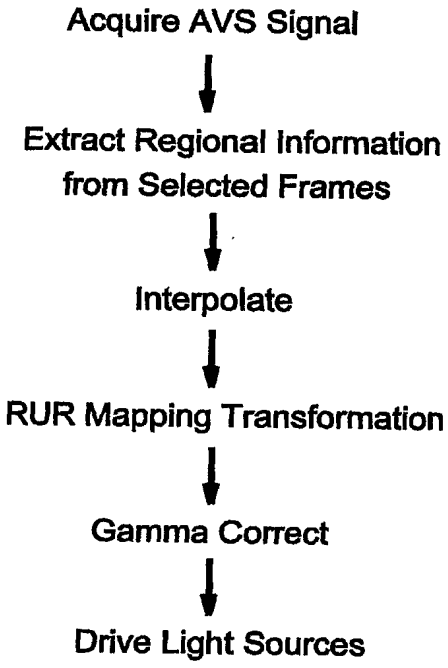


Fig. 19

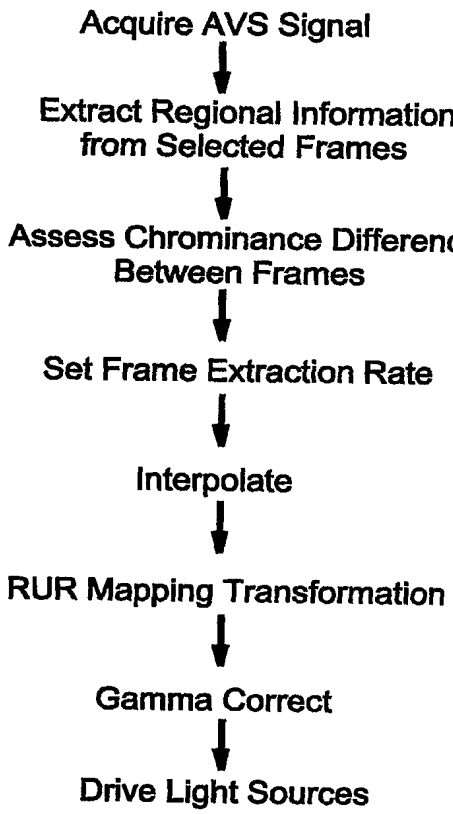


Fig. 20

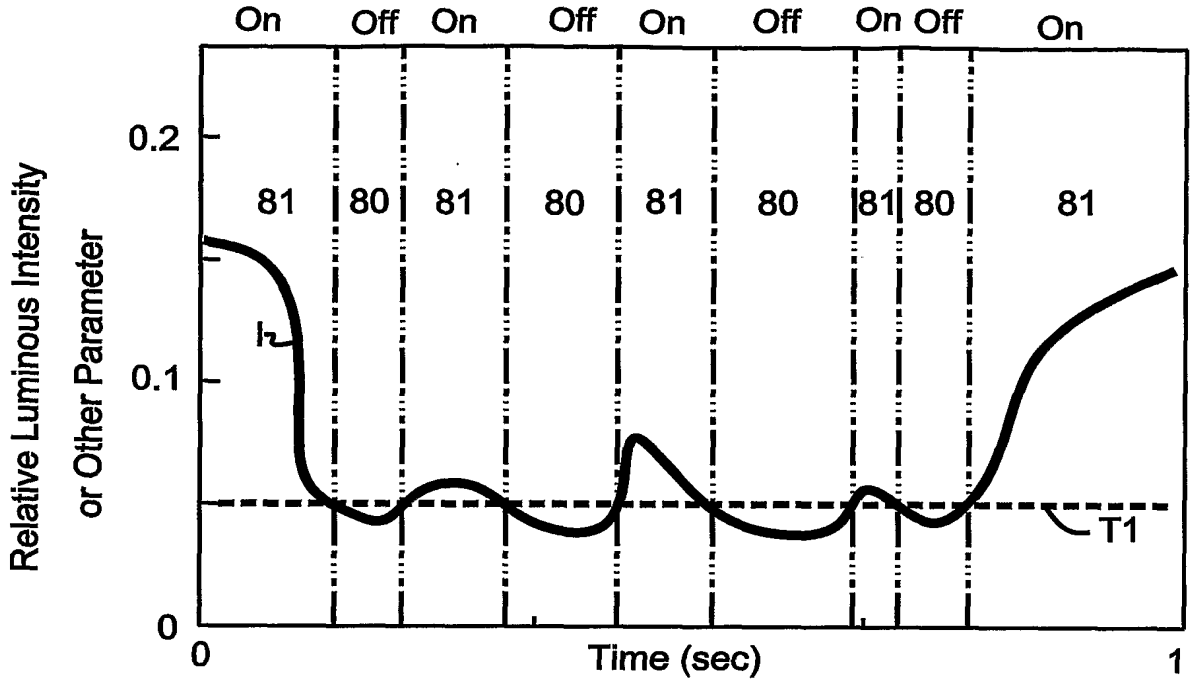

On
Off
On
Off
On
Off
On
Off
On
0.2
0.1
0
81
80
81
80
81
80
81
80
81
I
T1
Relative Luminous Intensity
or Other Parameter
0
Time (sec)
1

Fig. 21

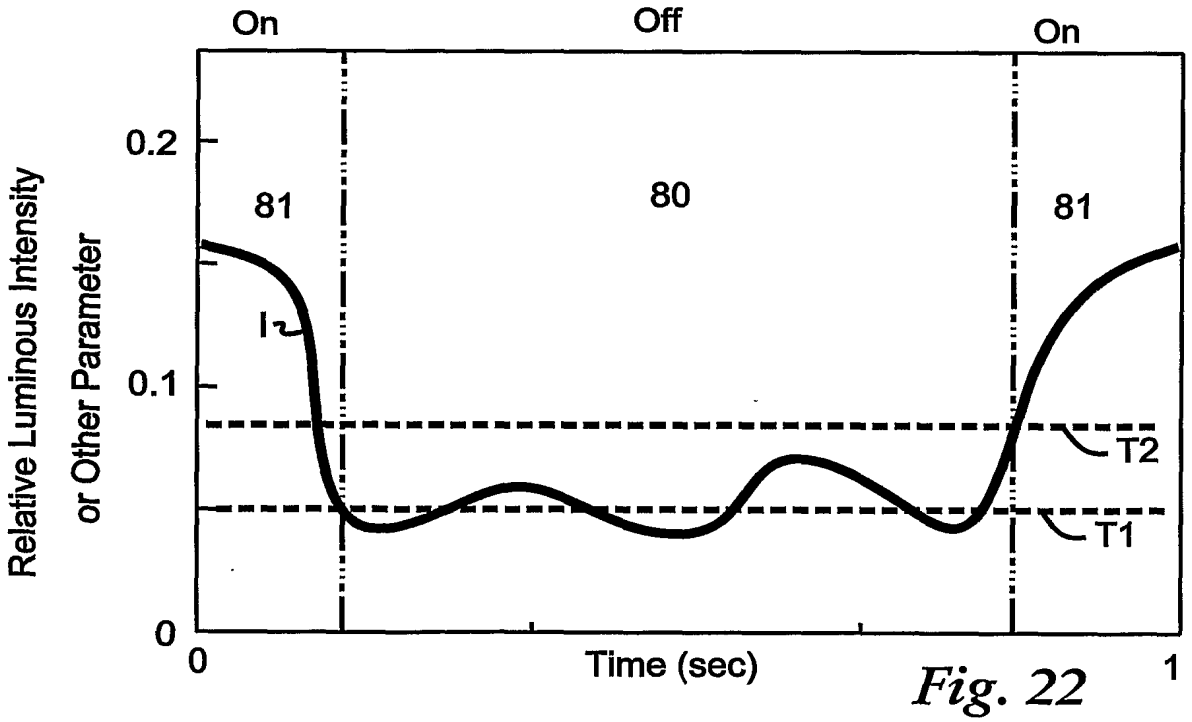

On
Off
On
0.2
0.1
0
81
80
81
I
T2
T1
Relative Luminous Intensity
or Other Parameter
0
Time (sec)
1

Fig. 22

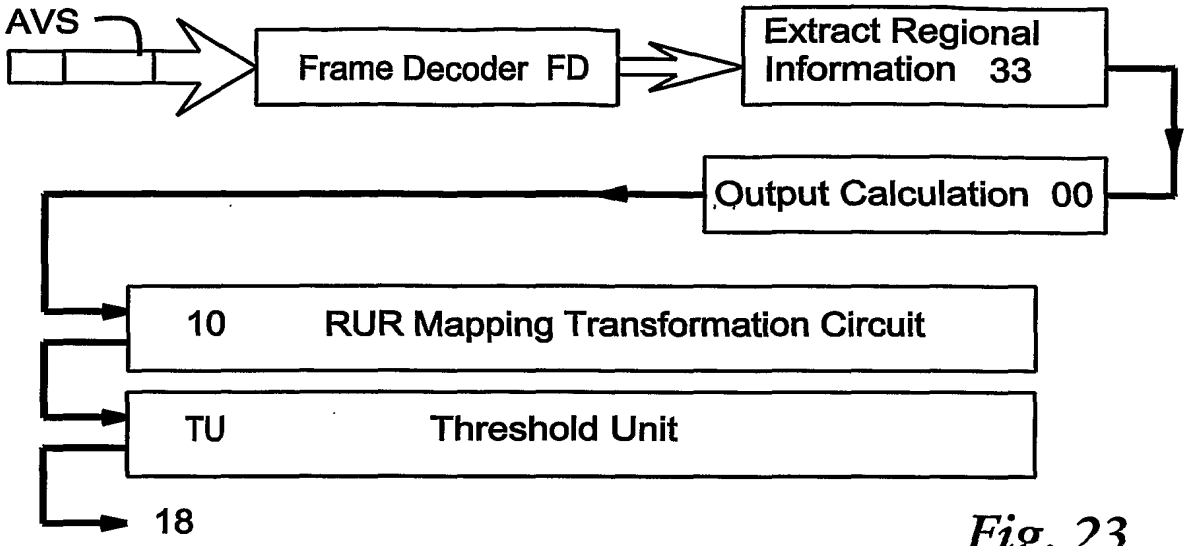

AVS
Frame Decoder FD
Extract Regional Information 33
Output Calculation 00
10 RUR Mapping Transformation Circuit
TU Threshold Unit
18

Fig. 23

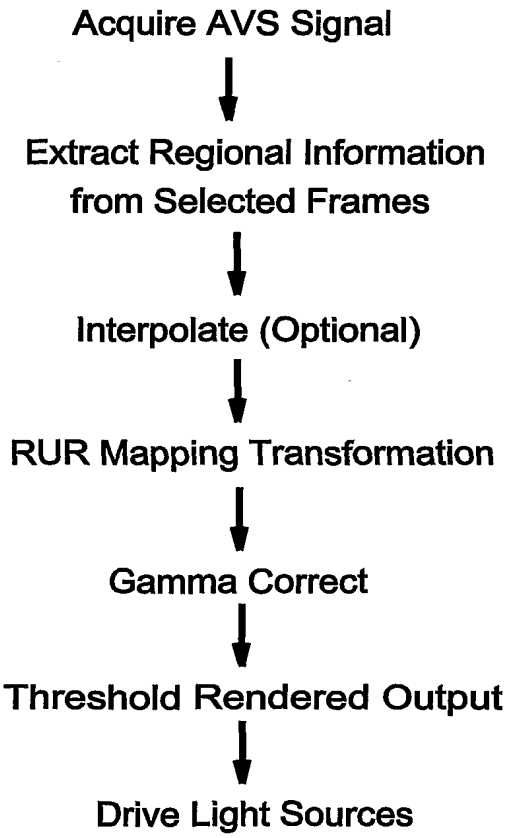

Acquire AVS Signal
Extract Regional Information from Selected Frames
Interpolate (Optional)
RUR Mapping Transformation
Gamma Correct
Threshold Rendered Output
Drive Light Sources

Fig. 24